

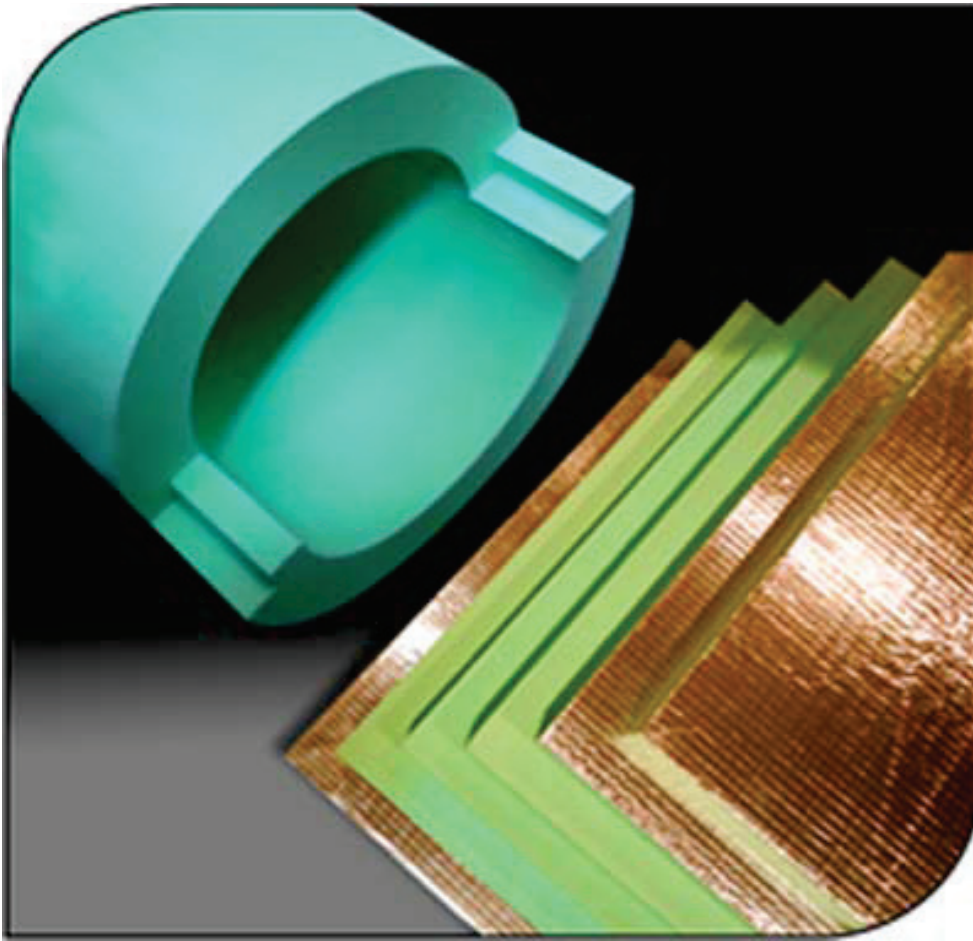


مصنع جلف كول ثيرم ذ.م.م.
GULF COOL THERM FACTORY LLC

Gulf Cool Therm Polyurethane (PUR) Insulation

- Cold Insulation for Oil, Gas and Refinery Industries
- Cryogenic Insulation
- Pipe, Slabs and Board Insulation

*The Quality Insulation
Products for Many Diverse
Application*



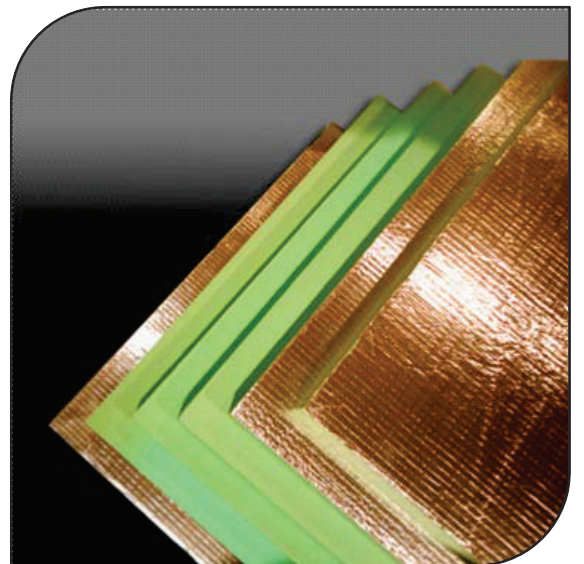
- Continuous PUR Foam Block Production
- Equipment / Tank / Vessel Insulation
- High Density Thermal Pipe Support Inserts
- High Density Thermal Duct Support Inserts
- High Density Support Spacer



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ABOUT US

We are pleased to introduce ourselves as a factory established in 1993, Sharjah – United Arab Emirates. Gulf Cool Therm Factory LLC is an ISO 9001:2008 Certified Company with Quality System certified by UKAS of United Kingdom.

Gulf Cool Therm Factory LLC, is a leading manufacturers and suppliers of high quality:

Thermal Insulation Materials

- **Pre-insulated Pipes and Fittings for District Cooling Application**
- **Polyisocyanurate Pipe, Duct, Slab and Vessel/Equipment Insulation**
- **Polyurethane Pipe, Slab and Vessel/Equipment Insulation**
- **Class 'O' CFC & HCFC Free Phenolic Foam Pipe, Duct, Wall and Roof Insulation**
- **Continuous PIR/PUR Foam Block Production**
- **Cold Insulation Materials for LNG, Oil and Gas Industries**
- **Foam Glass Insulation**
- **Phenolic Foam / Polyisocyanurate Pre-insulated Air Duct Panels**
- **Roof and Wall Insulation**
- **Polyurethane Spray Applied Foam**
- **High Density Thermal Support Inserts for piping and Ducting**
- **Heat Exchanger Insulated Box and Tray**
- **Field Joint Insulation and Application**

With many CNC Foam cutting machineries and production process units in the field with quality material available, highly qualified technical and commercial staff. We are confident that our product will comply with all international standard and definitely will meet your requirements.

In order to facilitate our client with best service and respect to quality, prompt delivery, respective elements of production and marketing were provided and enhanced under a tight quality control.



INSULATION MATERIAL

General Description

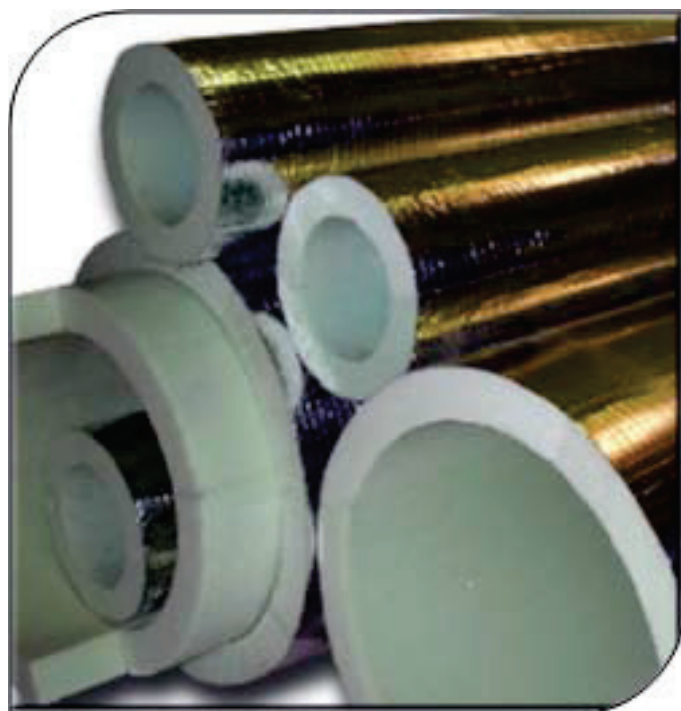
Gulf Cool Therm **Polyurethane** CFC Free Rigid Foam (PUR) is one of the most efficient, high performance insulation material, enabling very effective energy savings with minimal occupation of space.

Gulf Cool Therm **Manufacturers** CFC free rigid closed cell foam in a wide range of densities for different applications.

Density 35 to 65Kg/m³ for Pipe, Slab, Equipment, Vessel and Tank Insulation.

Density 80 to 120Kg/m³ for use in thermal Supports.

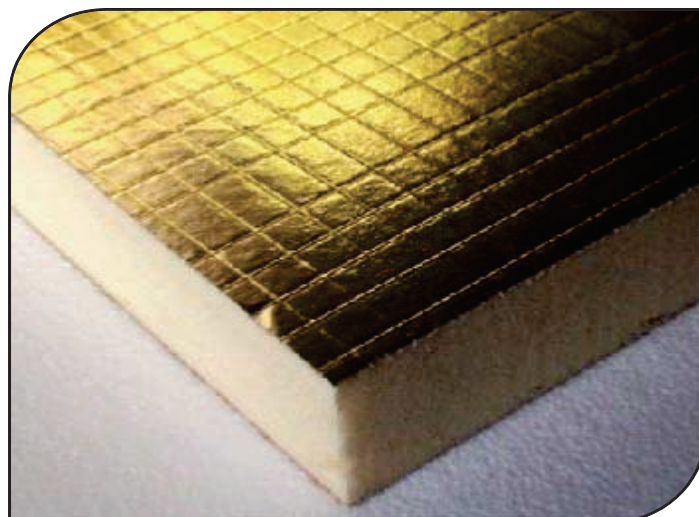
Gulf Cool Therm **Polyurethane** CFC Free Rigid Insulation is 95% closed cell and provides a long end satisfactory service life.



Gulf Cool Therm **Polyurethane** Foam can be used in many different applications in the process plant, Oil, Gas, refinery, Cold, Cryogenic and Air-conditioning industries. Standard foam meets the requirements of the German specification DIN 4102, Class B2/B3. If a higher performance level is required we can supply foam meet DIN 4012 Class B1.

Where higher temperature and/or better fire performance is required we recommend to use the Gulf Cool Therm **Polyisocyanurate** Insulations.

Gulf Cool Therm **Polyisocyanurate** meet the requirement of BS 476 part 6 & 7, Class 1 and ASTM E-84.





DENSITY

35 Kg/m³ to 65Kg/m³-Density for Pipe, Slabs, Board, Vessel, Tank, Equipment, Cryogenic Insulation.

80Kg/m³ to 360Kg/m³-Density for Thermal Supports. Other densities are available upon request.

SIZES

Pipe Sections up to 125 MM OD supplied in two half section. Sizes over 150 MM OD can be supplied in segments or two half sections as required.

Board/Slabs 1000 MM x 1000 MM OR 2000 MM x 1000 MM, Other sizes are available upon request.

AVAILABILITY

Slabs / Board, Pipe Sections, Pipe Fittings, Including Elbows, Tees, Reducers etc...



FINISHING

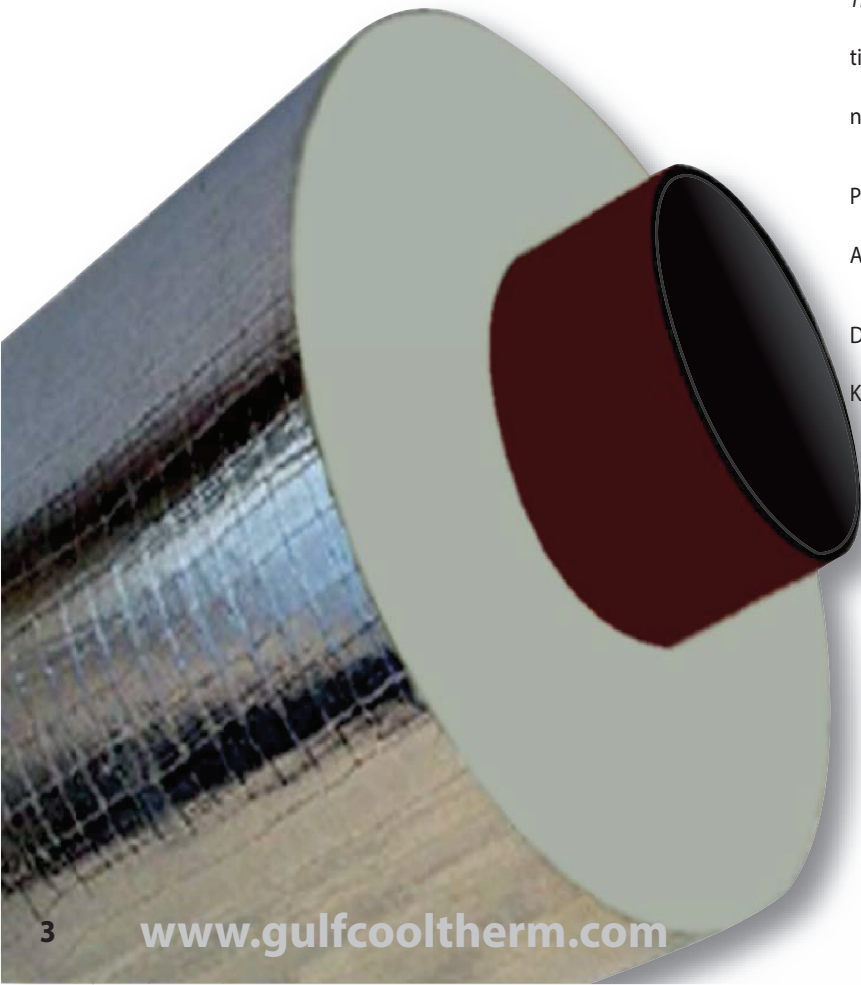
PIPE SECTION with reinforced Aluminium Class '1' foil faced.

PIPE SECTION with reinforced aluminium Class 'O' foil faced.

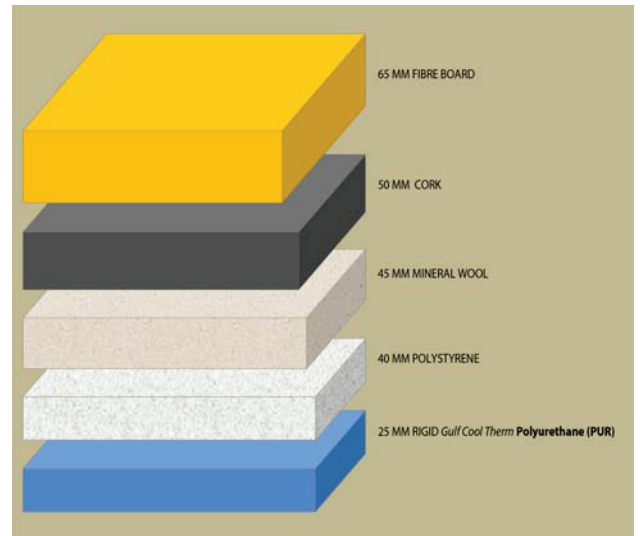
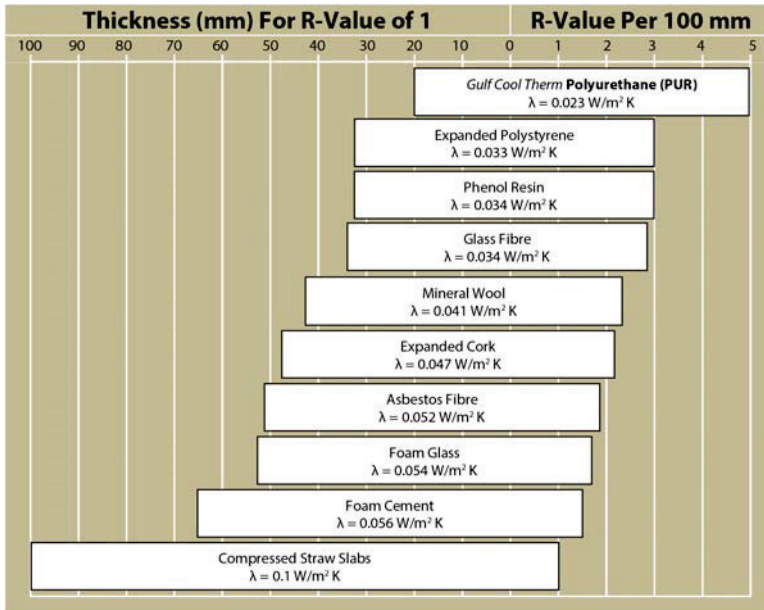
PIPE SECTION with Aluglass foil faced (Aluminized glass Cloth). *Gulf Cool Therm Polyurethane* Aluglass Finished Insulation is easy to fit and installation cost can save because of applying canvas cloth and vapour barrier will not be required.

PIPE Support Inserts or DUCT Support Inserts faced with reinforced Aluminium foil, Aluglass foil or Un-faced.

DUCT BOARD faced with one side reinforced Aluminium foil and other side Kraft Paper or Aluglass foil finished.



A λ factor, R-value per 100mm, and thicknesses for an R-value of 1 ($\text{m}^2 \text{ } ^\circ\text{K} / \text{W}$) for Comparative Thickness for same degree of Insulation (Dry Conditions)



Thickness of Gulf Cool Therm Polyurethane (PUR) for Calculated Metric Values of Thermal Resistance (R-value)

Comparative Thickness (mm) of commonly Specified Insulation Materials Required for Specific Metrics Values of Thermal Resistance (R-value)

Insulation Material Thermal Conductivity (λ) ²	Thermal Resistance - Metric R-Value ¹							
	5.43	4.75	4.33	3.75	3.17	2.74	1.87	1.59
	mm	mm	mm	mm	mm	mm	mm	mm
Polyurethane (PUR) 0.023 $\text{W/m}^2 \text{ K}$	108	95	87	75	63	55	37	32
Expanded Polystyrene 0.033 $\text{W/m}^2 \text{ K}$	181	158	144	125	106	91	62	53
Phenol Resin 0.033 $\text{W/m}^2 \text{ K}$	181	158	144	125	106	91	62	53
Glass Fibre 0.034 $\text{W/m}^2 \text{ K}$	187	164	149	129	109	94	65	55
Mineral Wool 0.041 $\text{W/m}^2 \text{ K}$	226	198	180	155	132	114	78	66
Expanded Cork 0.047 $\text{W/m}^2 \text{ K}$	259	226	206	179	151	130	89	76
Asbestos Fibre 0.052 $\text{W/m}^2 \text{ K}$	286	250	228	197	167	144	98	84
Foam Glass 0.054 $\text{W/m}^2 \text{ K}$	301	264	241	208	176	152	94	88
Foam Cement 0.056 $\text{W/m}^2 \text{ K}$	319	279	255	221	186	161	110	94
Compressed Straw Slabs 0.1 $\text{W/m}^2 \text{ K}$	543	475	433	375	317	274	187	159

M M	Thermal Conductivity ²	Thermal Resistances (R-value) ¹
	$\lambda = \frac{\text{W}}{\text{m}^2 \text{ } ^\circ\text{K}}$	$1 / \lambda = \frac{\text{m}^2 \text{ } ^\circ\text{K}}{\text{W}}$
25	0.020	1.25
38	0.0129	1.59
41	0.0119	1.73
48	0.0109	1.87
51	0.0102	2.01
54	0.0095	2.16
60	0.0089	2.30
64	0.0079	2.60
67	0.0074	2.74
73	0.0072	2.88
76	0.0067	3.02
83	0.0064	3.17
86	0.0062	3.32
89	0.0059	3.46
92	0.0057	3.61
95	0.0054	3.75
99	0.0053	3.89
102	0.0050	4.03
108	0.0049	4.18
111	0.0047	4.33
114	0.0046	4.47
118	0.0044	4.61
121	0.0043	4.75
124	0.0041	4.90
127	0.0040	5.05
130	0.0039	5.19
134	0.0038	5.33
143	0.0037	5.48

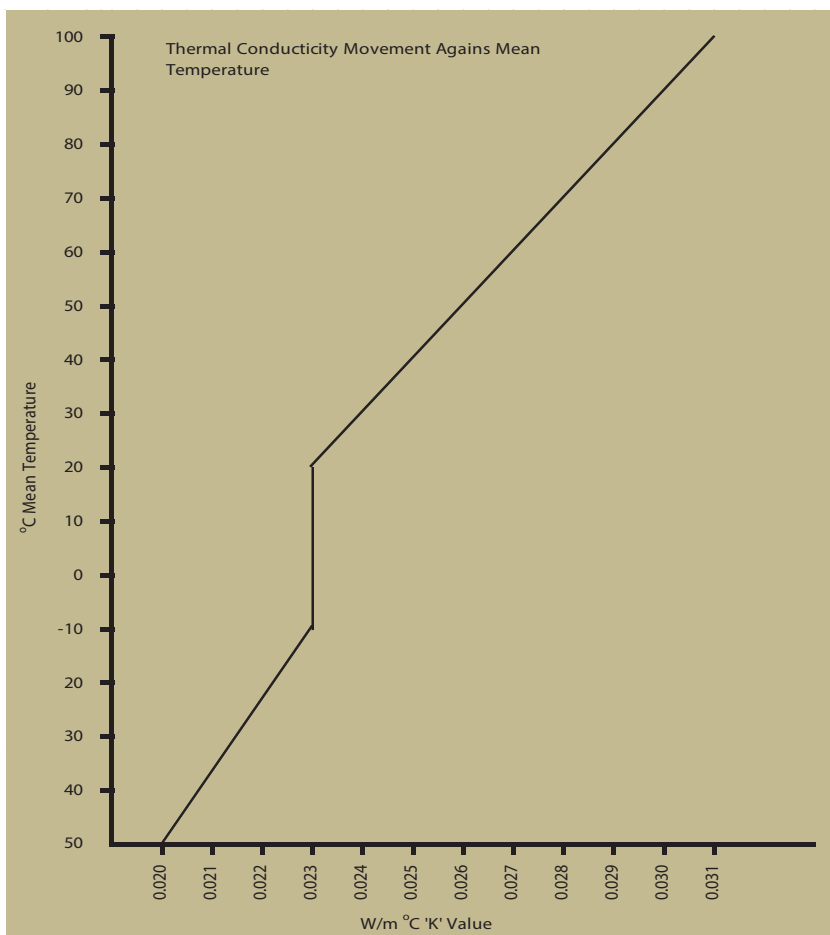
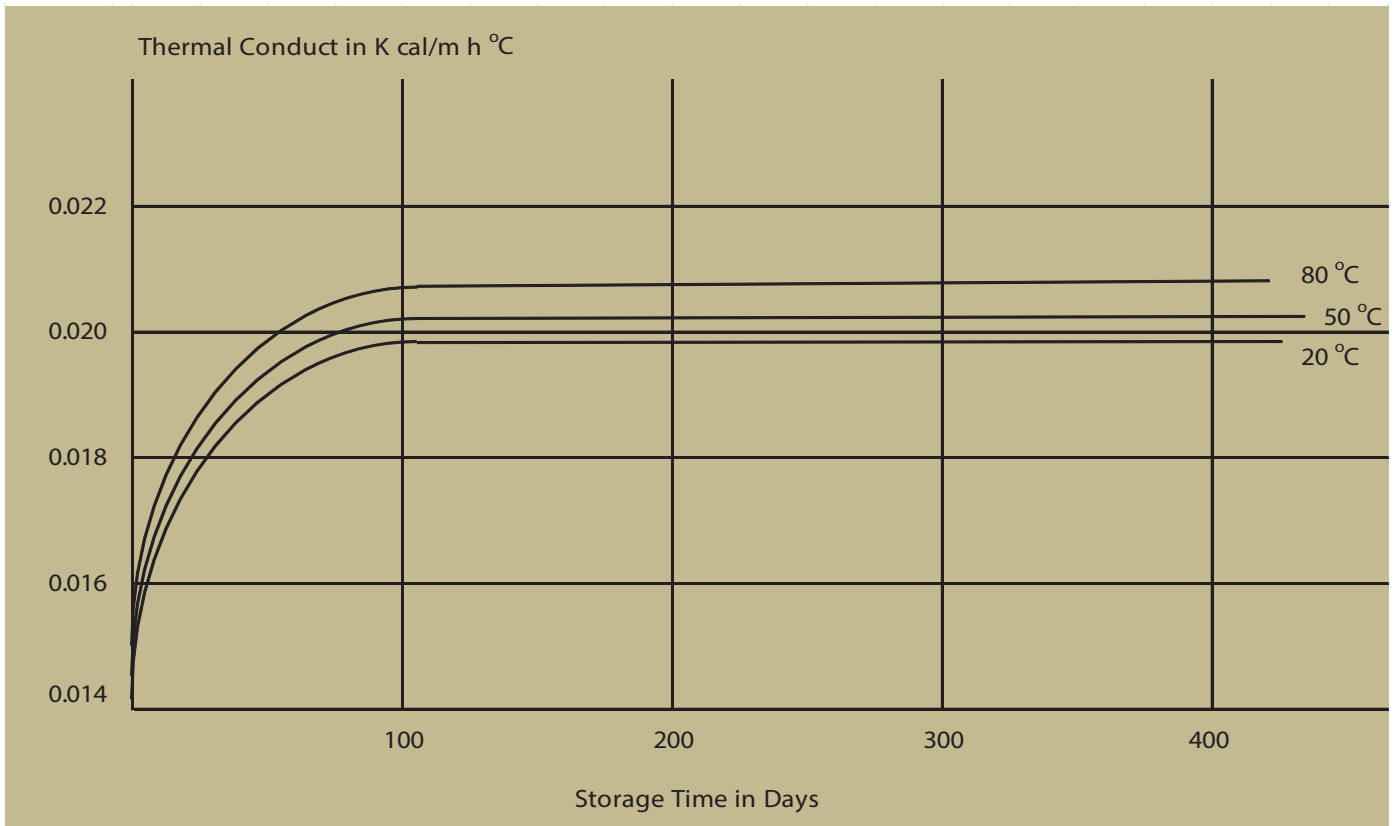
¹ Metric R = $\frac{\text{m}^2 \text{ K}}{\text{W}}$ Corresponds to British Thermal Unit R-Factor 1 $\frac{(\text{Btu}) (\text{in})}{(\text{ft}^2) (^\circ\text{F}) (\text{Hr})}$

² $\lambda = \text{W/m}^2 \text{ K}$ Corresponds to British Thermal Unit K-Factor $\frac{(\text{Btu}) (\text{in})}{(\text{ft}^2) (^\circ\text{F}) (\text{Hr})}$



Increase in thermal conductivity at various temperatures and prolonged storage time

For low temperature application Gulf Cool Therm **Polyurethane (PUR)** must be covered with a vapour barrier to avoid condensation or icing.

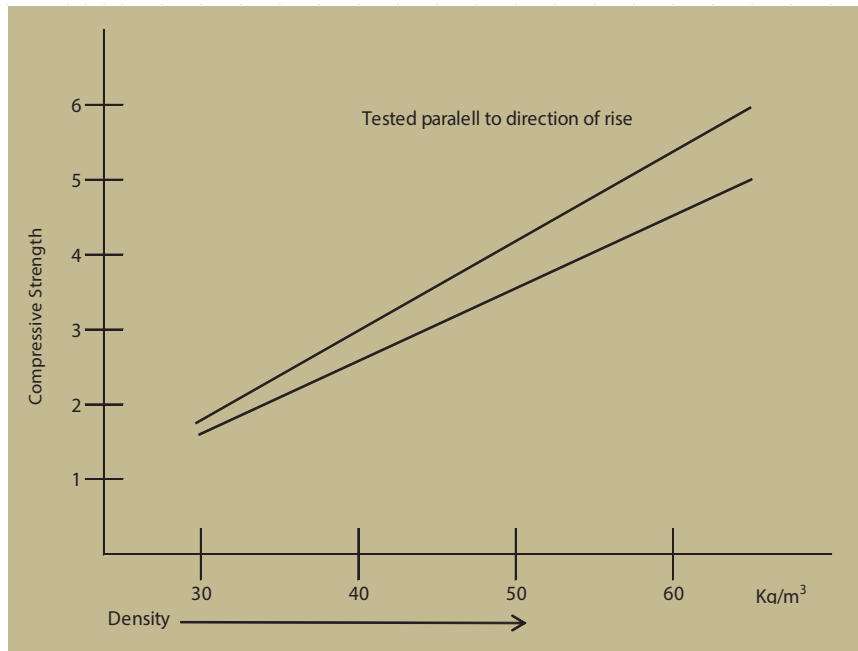


The graphs shown the Thermal Conductivity movement against mean temperature.

SERVICE TEMPERATURES

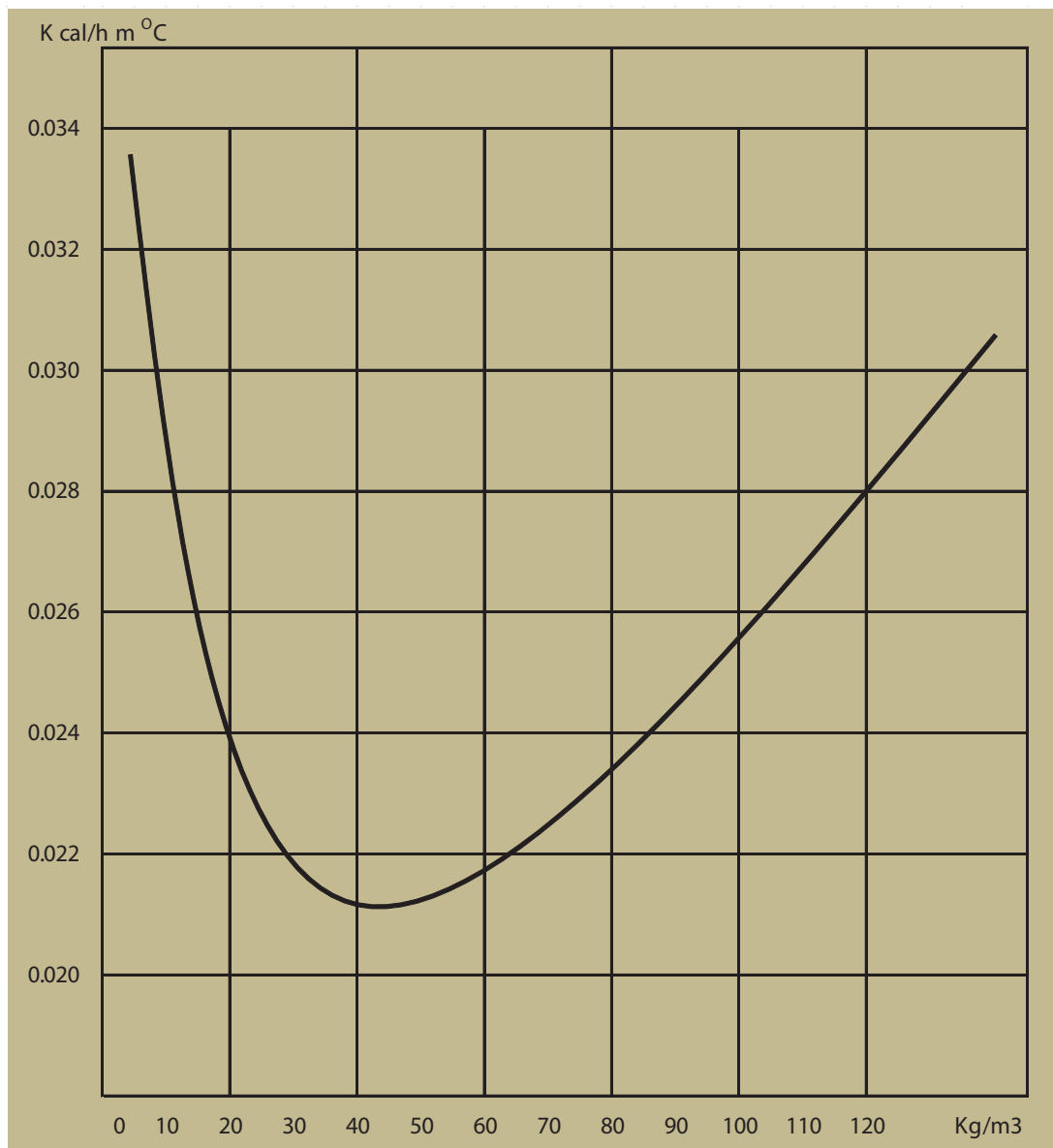
Gulf Cool Therm **Polyurethane (PUR)** can be used from -160 °C up to +140 °C. Temperatures below 0 °C and above 120 °C require special methods of installation. In such cases do not hesitate to contact us.





WORKABILITY

Gulf Cool Therm **Polyurethane (PUR)** can be easily cut with saw blades or knives. It is resistant to all kinds of adhesive, bituminous emulsions and hot bitumen (180 °C to 220 °C). We will, however, assist you to find the proper adhesives for your particular application.



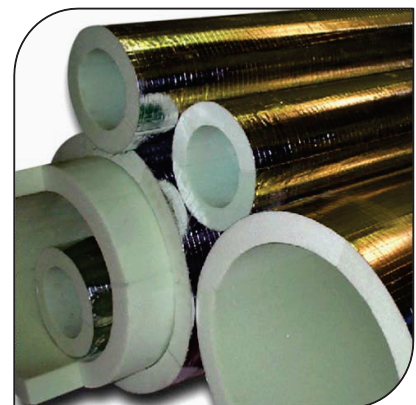
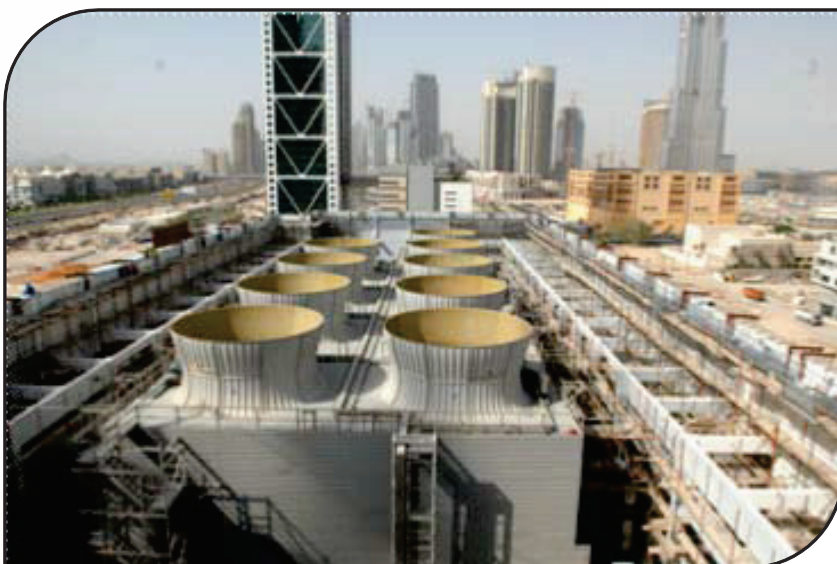
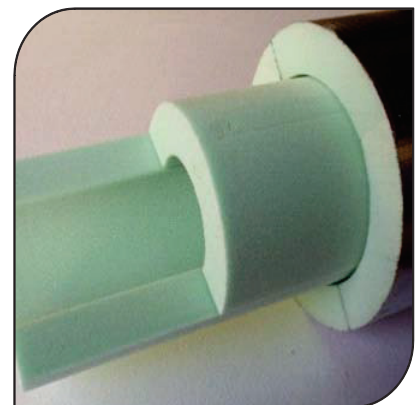
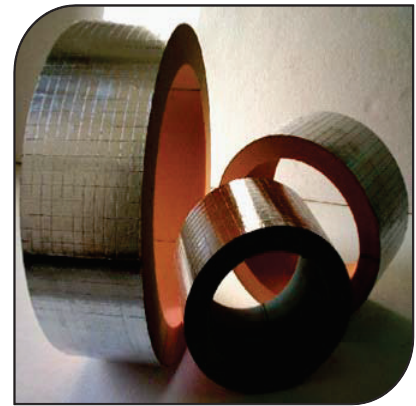
The graph shows the Thermal Conductivity of Gulf Cool Therm **Polyurethane (PUR)** Foam at different densities.

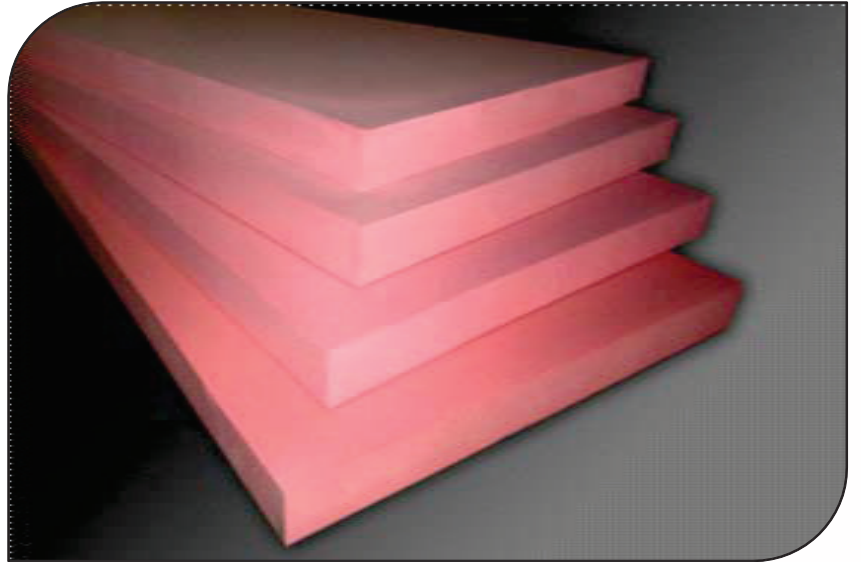
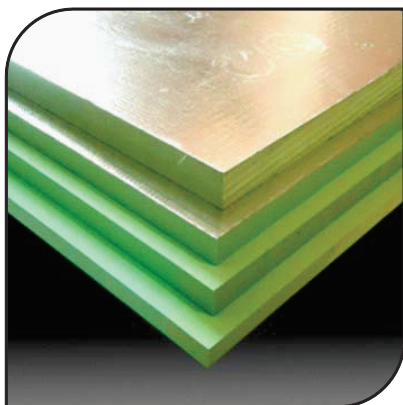
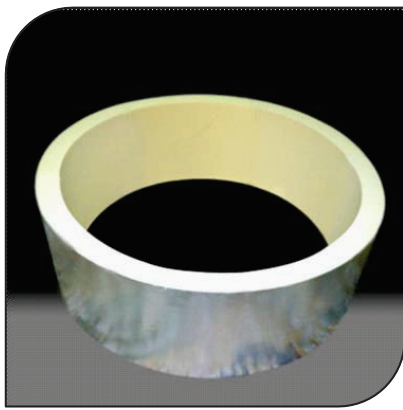
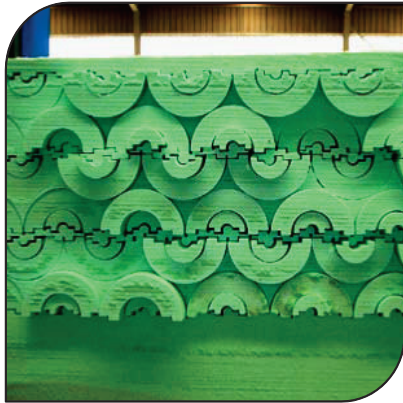


TECHNICAL DATA SHEET

Properties	Test Method	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
Nominal Density: Kg/m ³ (lb/ft ³)	ASTM D - 1622	PUR 35 (2.18)	PUR 50 (3.12)	PUR 65 (4.05)	PUR 80 (4.99)	PUR 100 (6.24)	TS 120 (7.49)	TS 160 (9.98)	TS 180 (11.23)	TS 200 (12.48)	TS 250 (15.60)	TS 360 (22.47)
Thermal Conductivity @10°C (50°F) aged W/m*K (Btu-in/h*ft ² °F)	ASTM C518/91	0.023 (0.159)	0.023 (0.159)	0.024 (0.166)	0.027 (0.187)	0.030 (0.207)	0.032 (0.221)	0.034 (0.0235)	0.034 (0.235)	0.034 (0.235)	0.035 (0.241)	0.038 (0.262)
Average Compressive Strength @ 10% Relative Deformation: kPa (lb/in ²)	ASTM D-1621 BS EN 826:1996	245 (35.53)	365 (52.93)	750 (108.77)	1120 (162.44)	1400 (203.05)	1680 (243.66)	>1790 (259.60)	>2000 (>290.06)	2400 (348.09)	>4000 (>580.13)	>7000 (>1015.23)
Compressive Modulus: kPa (lb/in ²)	ASTM F-1839-01	13020 (1888.39)	18600 (2697.70)	24200 (3509.91)	29880 (4333.72)	37360 (4333.72)	44830 (6502.04)	59600 (8644.24)	66300 (9616.00)	72250 (10478.98)	90150 (13075.15)	128350 (18615.59)
Tensile Strength: kPa (lb/in ²)	ASTM D-1623	220 (31.9)	385 (55.83)	730 (105.87)	1080 (156.64)	1340 (195.65)	1610 (233.51)	2140 (310.36)	2400 (348.07)	2650 (384.33)	>3310 (>480.05)	>4300 (>623.63)
Shear Strength: kPa (lb/in ²)	ASTM F-1839-01	225 (32.63)	390 (56.56)	610 (88.47)	850 (123.28)	1070 (155.19)	1280 (185.64)	1525 (221.17)	1730 (250.9)	1950 (282.81)	>2445 (>354.6)	>3210 (>465.55)
Shear Modulus: kPa (lb/in ²)	ASTM F-1839-01	3620 (525.03)	5210 (755.64)	6770 (981.9)	10910 (1582.36)	13640 (1978.31)	16360 (2372.81)	17020 (2468.54)	>18730 (>2716.55)	20800 (3016.78)	>25945 (>3763.00)	>37350 (>5417.16)
Closed Cell Content (Apparent vol. %)	ASTM D-2856	95	95	95	96	98	98	98	98	98	98	98
Avg. Water Vapor Transmission (grains/h*ft ²)	ASTM E96-00	1.19	1.12	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.25
Water Absorption % W/V	ASTM D-2842	2.25	2	1.5	1.3	0.8	0.8	0.2	0.2	0.2	0.18	0.15
Dimensional Stability (% Linear Change) 24 hours @ -20 °C 24 hours @ +110 °C 24 hours @ +70 °C 100% RH	ASTM D-2126	Negligible 1.5 2	Negligible 1.5 2	Negligible 1 1.5	Negligible <1 <1	Negligible <1 <1	Negligible <1 <1	Negligible <1 <1	Negligible <1 <1	Negligible <1 <1	Negligible <1 <1	Negligible <1 <1
Upper Temperature Limit °C (°F)		140 (284)	140 (284)	140 (284)	140 (284)	140 (284)	140 (284)	140 (284)	140 (284)	140 (284)	140 (284)	140 (284)
Linear Coefficient of Expansion m/m*K	ASTM D-696	40-70x10 ⁻⁶	40-70x10 ⁻⁶	40-70x10 ⁻⁶	40-70x10 ⁻⁶	40-70x10 ⁻⁶	40-70x10 ⁻⁶	40-70x10 ⁻⁶	40-70x10 ⁻⁶	40-70x10 ⁻⁶	40-70x10 ⁻⁶	40-70x10 ⁻⁶
Flammability Class	BS 4102	B2	B2	B2	B2	B2/B3	B2/B3	B2/B3	B2/B3	B2/B3	B2/B3	B2/B3
Average time & Extent of Burning (mm)	ASTM D-635:91	<5	<5	<5	5	5	5	5	5	5	5	5

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Easy to Fit - Energy Saving

*The Quality Insulation
Products for Many Diverse
Application*

